

DATABASE SYSTEMS

Introduction to MySQL



Database System Course, 2016

AGENDA FOR TODAY



Administration



Database Architecture on the web



Database history in a brief



Databases today



MySQL

What is it

How to use it



Homework

ADMINISTRATION

 **Me** (email, office, office hours): [cs.tau.ac.il/~amitsome](mailto:amitsome@cs.tau.ac.il)

 **About the recitations:**

- 3 of the course lectures are recitations:
 - 1.This one (introduction to MySQL and how to use it in HW#1)
 - 2.DB programming (How to correctly use the DB programmatically, useful for the final project)
 - 3.Web programming (How to build a web UI, useful for the final project)
- Will focus **only** on the practical side of database programming
- Suppose to help you with the final project, but not to explain you Tova's lectures.
- Attendance is not mandatory. However, the material, pointers and directions I give in class are valid, and ignoring them might effect your project final grade.

ADMINISTRATION



About our forum:

- <http://courses.cs.tau.ac.il/0368-3458/forum>
- It works like StackOverflow: you vote up, vote down and select the best answers.
- Please use meaningful titles and devote some time to phrasing your question so everyone can understand.
- Material related questions will not be answered elsewhere. Don't ask me what is a left-outer join in a private email because I will not answer.
- **Final grade bonus**: will be given to the top 5 users in the forum (rank): [1,2,3,4,5] for [5th, 4th, 3rd, 2nd, 1st)

ADMINISTRATION



Homework Submission

- Submission date is on the website.. (No late arrivals will be accepted)
- Work should be done in pairs
- Submission is done via moodle, by one of the partners
- Submit a zip file, with
 - an answers pdf that contains the full names and IDs of both partners on top of the page
 - A .sql file for every query. **Make sure it's runnable.**

ADMINISTRATION



The final project

- You will build a website with a database.
- However the focus will be on the database design, optimization, SQL queries, and DB programming best practices. We do not care how pretty your UI is, though we can give you bonus points for that.
- It's really useful and practical project, since today everything is web-based.
- Work in groups of 4-5.
- It is a lot of work, **so start early**
- One Milestone (see dates on the website)
- You can choose between PHP or Python.

ADMINISTRATION



System support

- During this class, you will use several servers/frameworks belonging to the university e.g. Nova , Mysql server, and the python/php web-server.
- If you encounter a system problem, you have to email **system@cs.tau.ac.il**. They are really nice and will help you if you encounter problems.



Technical Issues






- Remember that MySQL, SQL, Database programming and web programming are among the most common topics in the computer science community.
- Use google, use Stackoverflow, watch tutorials and video lectures.



Other Issues

- Use the Moodle forum for non-technical questions e.g. finding partners
- Email me if you have a private problem that will most certainly not be of interest to other students
- Come to my office hours (by appointment)!

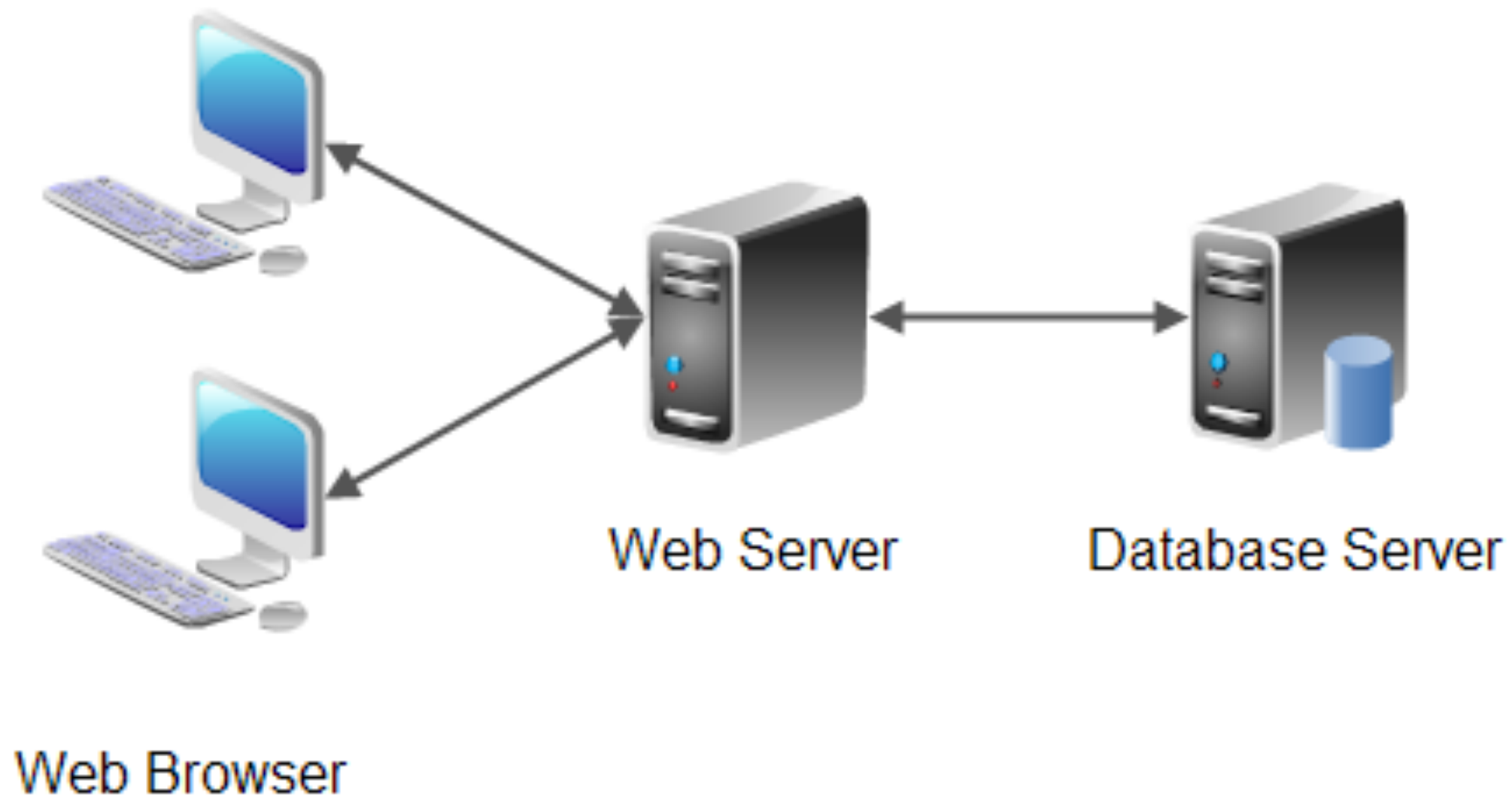
AGENDA FOR TODAY

-  Administration
-  **Database architecture on the web**
-  Database history in a brief
-  Databases today
-  MySQL
 - What is it
 - How to use it
-  Homework


DATABASE ARCHITECTURE ON THE WEB (BRIEF)


- 🐟 Database server is a **standalone** server.
- 🐟 Database server is not accessible to web-users (when configured securely)
- 🐟 Only the web server communicates with the DB.
- 🐟 Administrators have special permissions to access to the database management system directly.

DATABASE ARCHITECTURE ON THE WEB (ILLUSTRATION)



DATABASE ARCHITECTURE ON THE WEB (EXTENDED)

 Database is a process, running within an operation system on a physical or virtual server.

 When running, the data base software process binds a listening network port on a local interface.

 A web server is also a process, binding a listing port.

 **Security configuration (e.g. in a Firewall)**

Only the web server is allowed to connect to the DB port.

Administrator user is allowed to connect to the DB port directly (in a secured connection, like you soon....^_^)

The web server is open to web-users.

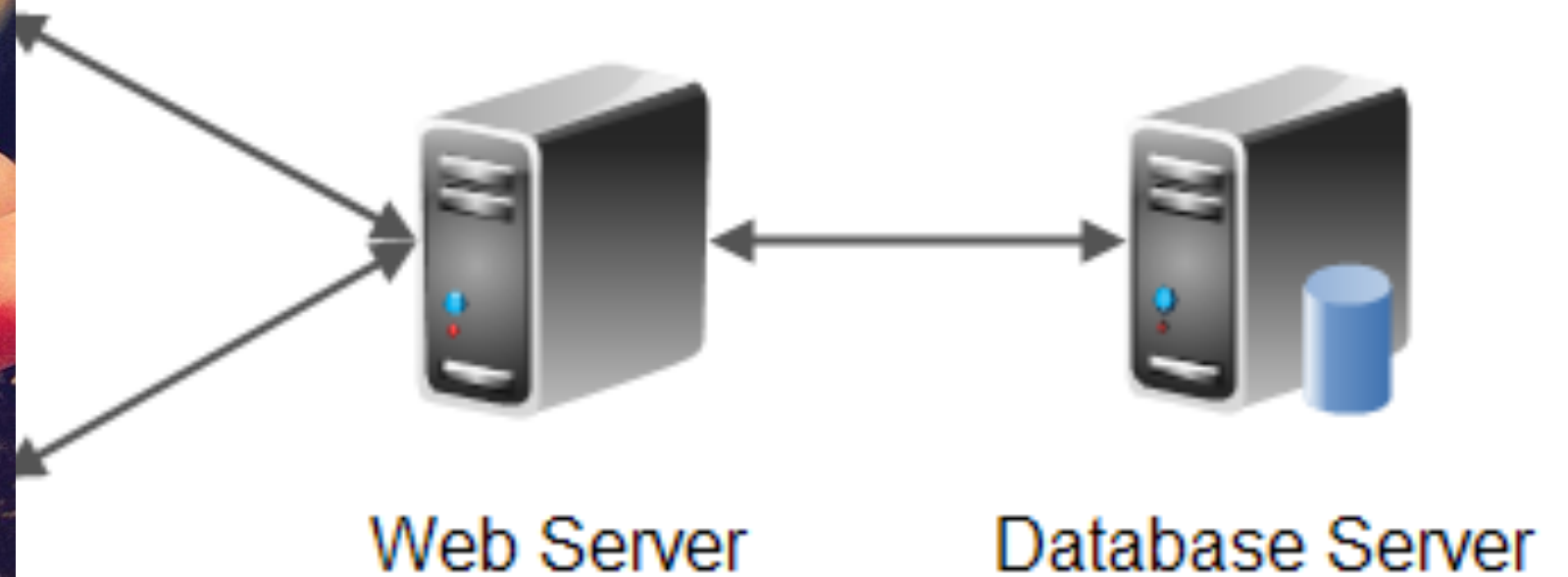
DATABASE ARCHITECTURE ON THE WEB (EXTENDED)



Web session illustration in 6 simple stages

1. A client opens a web browser in her computer
2. Within the web browser she type the URL of a website (e.g. ynet.co.il)
3. The browser issues an HTTP session to request the website's content.
4. The web server receive the HTTP request
5. The web server connects to the DB server to retrieve data (e.g., current articles of today)
6. The web server returns the client the content of the page.

HOW DOES INSTAGRAM WORKS?



HOW DOES INSTAGRAM WORKS?



Web Server

Database Server

- ★ Image Processing
- ★ UI operations

- ★ Authentication
- ★ Notifications
- ★ API

- ★ Images table
- ★ Users table

AGENDA FOR TODAY



Administration



Database Architecture on the web



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DATABASE HISTORY

1966 IBM: Information Management System

 Designed for the Apollo space program, to store inventory, components and matters for Saturn V rocket. It was running on an IBM mainframe computer.

 IMS was a **hierarchical database**, relying on the "manual" navigation of a linked data set which was formed into a large network. Applications could find records by one of three methods:

1. Use of a primary key (known as a CALC key, typically implemented by hashing)
2. Navigating relationships (called sets) from one record to another
3. Scanning all the records in a sequential order



DATABASE HISTORY

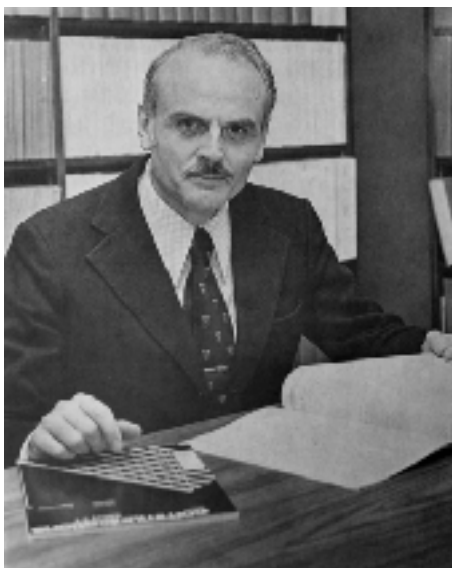
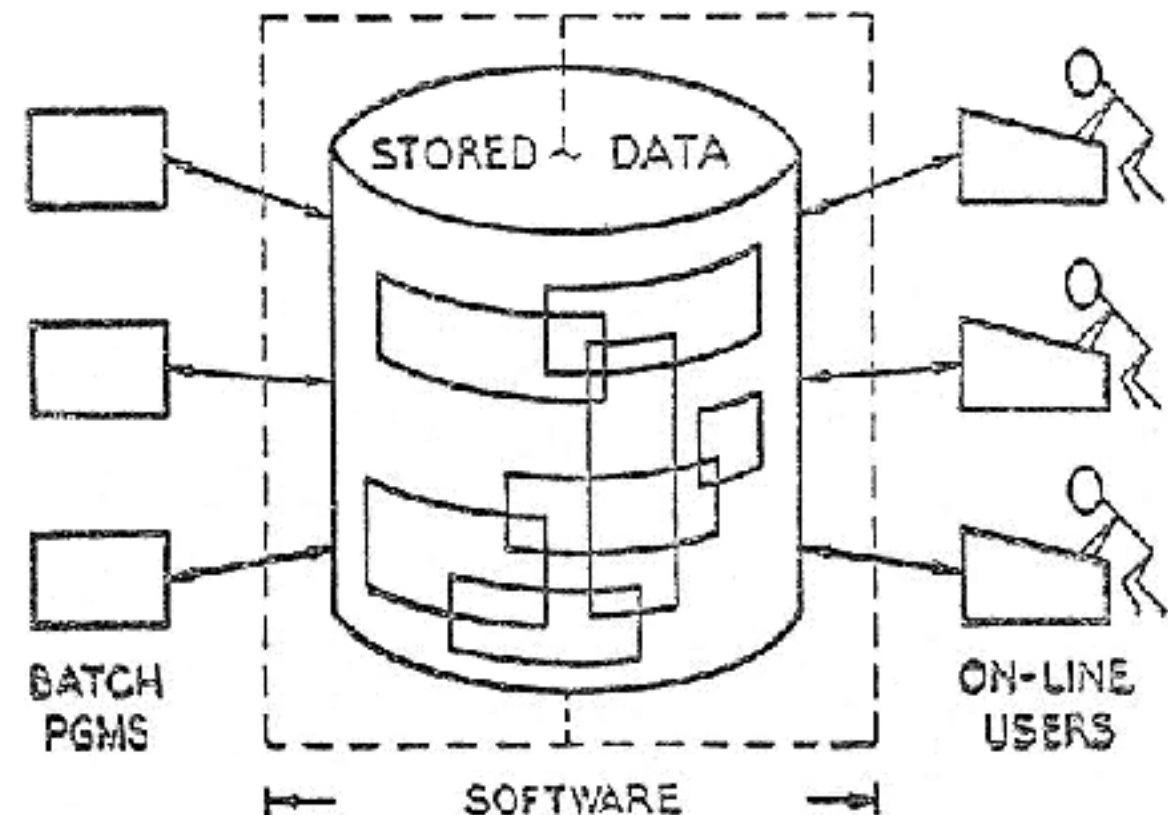
🐟 1970 The relational model (theoretical)

- 🐟 Mechanical hard drives invented
- 🐟 It's sucks to search in the hierarchical DB,
- 🐟 Invented by Edgar Codd from IBM

🐟 1974 IBM “System R”

- 🐟 R is for relational.
- 🐟 First implementation of SQL
- 🐟 Proving the performance and usability of the relational model

A DATABASE SYSTEM

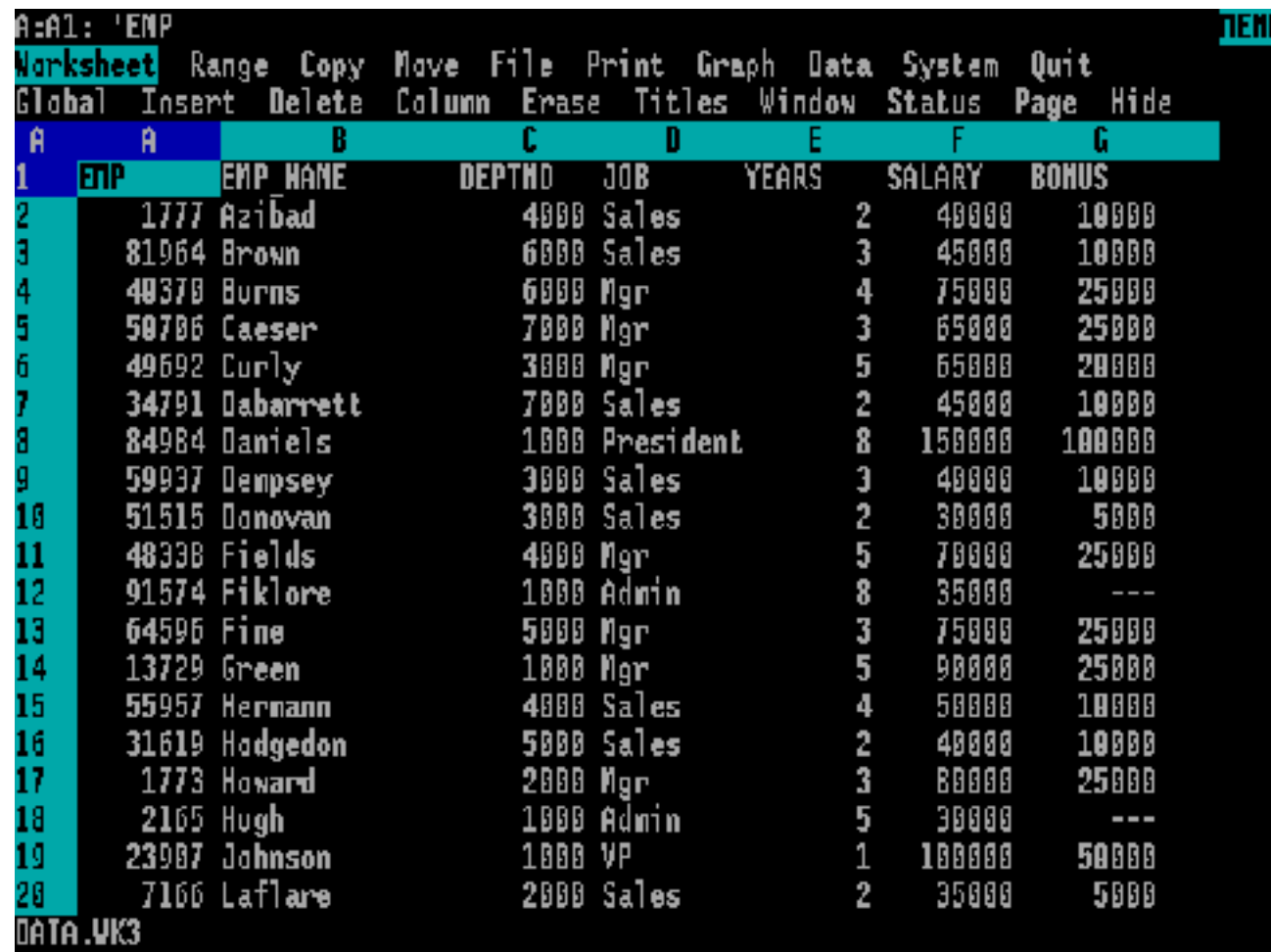


DATABASE HISTORY

1980 Personal Databases

 Desktops are introduced to the world

 People use spread-sheet software Like IBM Lotus




The screenshot shows a terminal window with a menu at the top and a data table below. The menu includes options like Worksheet, Range, Copy, Move, File, Print, Graph, Data, System, and Quit. The data table has columns for EMP, EMP NAME, DEPTNO, JOB, YEARS, SALARY, and BONUS. The data is displayed in a simple text format with a light blue header row and a light blue selection bar on the left.

EMP	EMP NAME	DEPTNO	JOB	YEARS	SALARY	BONUS
1777	Azibad	4000	Sales	2	40000	10000
81964	Brown	6000	Sales	3	45000	10000
40370	Burns	6000	Mgr	4	75000	25000
50706	Caesar	7000	Mgr	3	65000	25000
49692	Curly	3000	Mgr	5	65000	20000
34791	Dabarrett	7000	Sales	2	45000	10000
84984	Daniels	1000	President	8	150000	100000
59937	Dempsey	3000	Sales	3	40000	10000
51515	Donovan	3000	Sales	2	30000	5000
48338	Fields	4000	Mgr	5	70000	25000
91574	Fiklore	1000	Admin	8	35000	---
64596	Fine	5000	Mgr	3	75000	25000
13729	Green	1000	Mgr	5	90000	25000
55957	Hermann	4000	Sales	4	50000	10000
31619	Hodgedon	5000	Sales	2	40000	10000
1773	Howard	2000	Mgr	3	80000	25000
2165	Hugh	1000	Admin	5	30000	---
23987	Johnson	1000	VP	1	100000	50000
7166	Laflare	2000	Sales	2	35000	5000

DATABASE TODAY

Distributed RDBMS

Apache Hadoop

 **Map Reduce:** (2 stages: first “Map” a job to a node then “Reduce”, where each node process and return

In memory RDBMS

 **Apache SPARK** is both distributed and uses fast in-memory computations

NO-SQL

 Non sql data stores , e.g. Graph storages, Key-value (like “dictionaries” in Python)

Columnar Databases:
























Stores columns instead of rows

Useful for data cubes and aggregations

Becoming less popular because of the “in-memory” analytics nowadays

DATABASES TODAY

310 systems in ranking, November 2016

Rank			DBMS	Database Model	Score		
Nov 2016	Oct 2016	Nov 2015			Nov 2016	Oct 2016	Nov 2015
1.	1.	1.	Oracle 	Relational DBMS	1413.01	-4.09	-67.94
2.	2.	2.	MySQL 	Relational DBMS	1373.56	+10.91	+86.71
3.	3.	3.	Microsoft SQL Server	Relational DBMS	1213.80	-0.38	+91.48
4.	 5.	 5.	PostgreSQL	Relational DBMS	325.82	+7.12	+40.13
5.	 4.	 4.	MongoDB 	Document store	325.48	+6.67	+20.87
6.	6.	6.	DB2	Relational DBMS	181.46	+0.90	-21.07
7.	7.	 8.	Cassandra 	Wide column store	133.97	-1.09	+1.05
8.	8.	 7.	Microsoft Access	Relational DBMS	125.97	+1.30	-14.99
9.	9.	 10.	Redis	Key-value store	115.54	+6.00	+13.13
10.	10.	 9.	SQLite	Relational DBMS	112.00	+3.43	+8.55
11.	11.	 14.	Elasticsearch 	Search engine	102.58	+3.46	+27.80
12.	12.	 13.	Teradata	Relational DBMS	75.16	-1.07	-1.92
13.	13.	 11.	SAP Adaptive Server	Relational DBMS	70.16	+0.68	-13.55
14.	14.	 12.	Solr	Search engine	68.36	+1.79	-11.41
15.	15.	15.	HBase	Wide column store	58.74	+0.54	+2.28
16.	 17.	 18.	Splunk	Search engine	54.73	+1.73	+10.11
17.	 16.	17.	FileMaker	Relational DBMS	53.92	-1.03	+2.19
18.	 19.	 19.	SAP HANA 	Relational DBMS	49.27	+3.50	+9.65

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MYSQL: INTRODUCTION

What is MySQL?

-  A relational database management system (RDBMS)
-  Free and open-source software written in C and C++

Why do we learn MySQL?

-  It's the most common database in the web (client-server model)
-  Uses by: Facebook, Google, Twitter,
-  Is super simple (comparing to Oracle, PostgreSQL)

3 things you (maybe) didn't know about MySQL

-  First version was out on 1995
-  It is actually owned by Oracle, since 2010
-  When it happened, one of the founders quit and forked **Maria-DB** which is still free under the GNU license



MYSQL: CONNECT REMOTELY


SQL Clients

 CLI (command-line interface), mainly for 1337 h4x0r\$

 SQL Software (i.e. workbench, Heidi, Dbeaver)

 PhpMyAdmin (web based)

 **For security reasons, connection is over SSH, remember?**

 **FYI:** Our MySQL server is an internal sever and you will use it both in the final project and in HW#1



WAIT-A-MINUTE: SSH?

Secure Shell (SSH)

- ★ A network (layer 7) protocol
- ★ Providing secured channel to a remote host.
- ★ Built-in client in Unix based systems
- ★ Putty is required in Windows based systems.



MYSQL: CONNECT REMOTELY (+SSH)

Command line connection (unix)

```
➔ ~ ssh amitsome@nova.cs.tau.ac.il
amitsome@nova.cs.tau.ac.il's password:
Last login: Mon Mar 14 22:44:02 2016 from 37.142.245.121
nova 1% █
```

```
[nova 1% mysql -h mysqlsrv.cs.tau.ac.il -u sakila -p
[Enter password:
Welcome to the MySQL monitor.  Commands end with ; or \g.
Your MySQL connection id is 1368667
Server version: 5.5.35-1ubuntu1-log (Ubuntu)
```

MYSQL: CONNECT REMOTELY (+SSH)

 **Command line connection
(unix)**

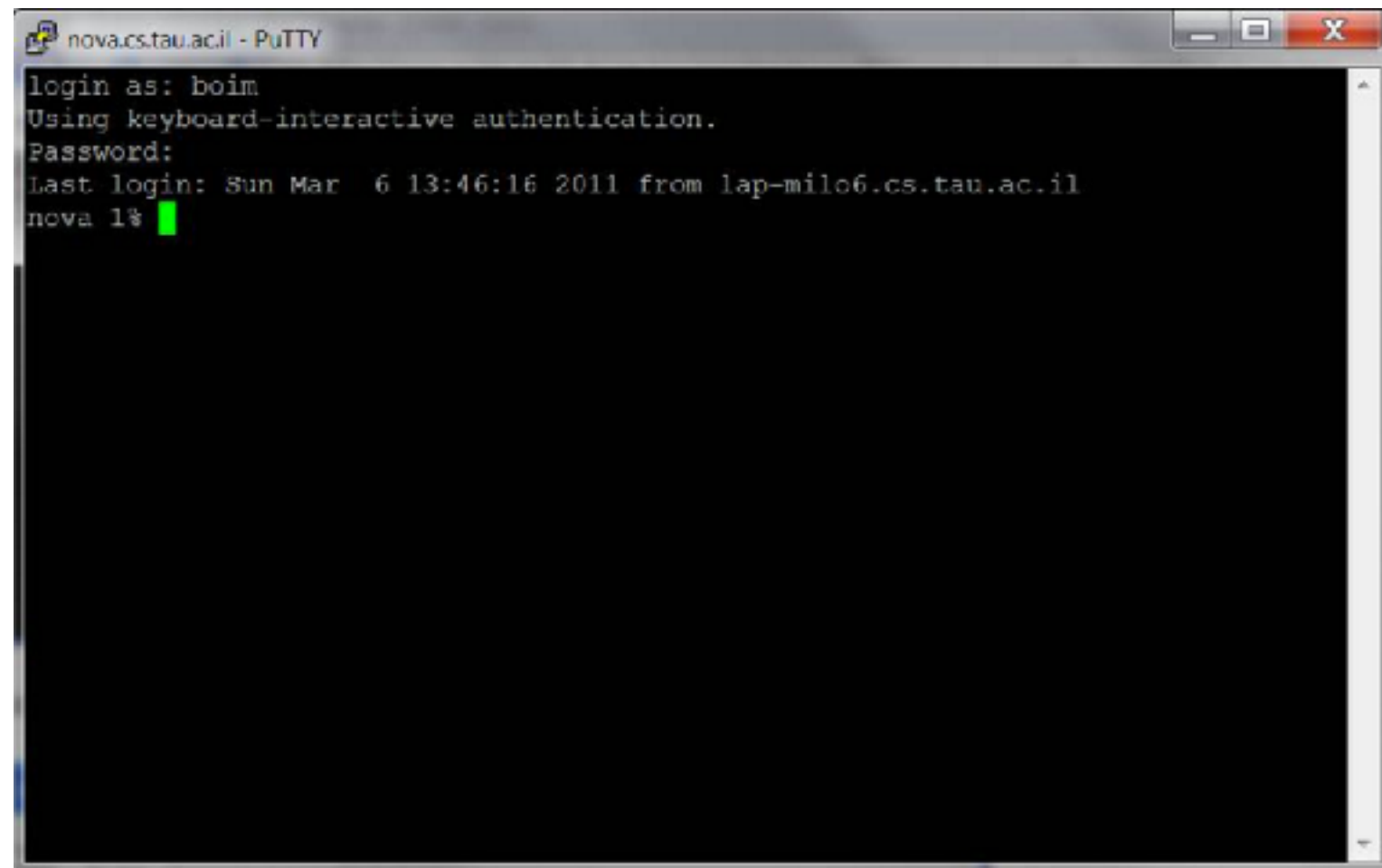
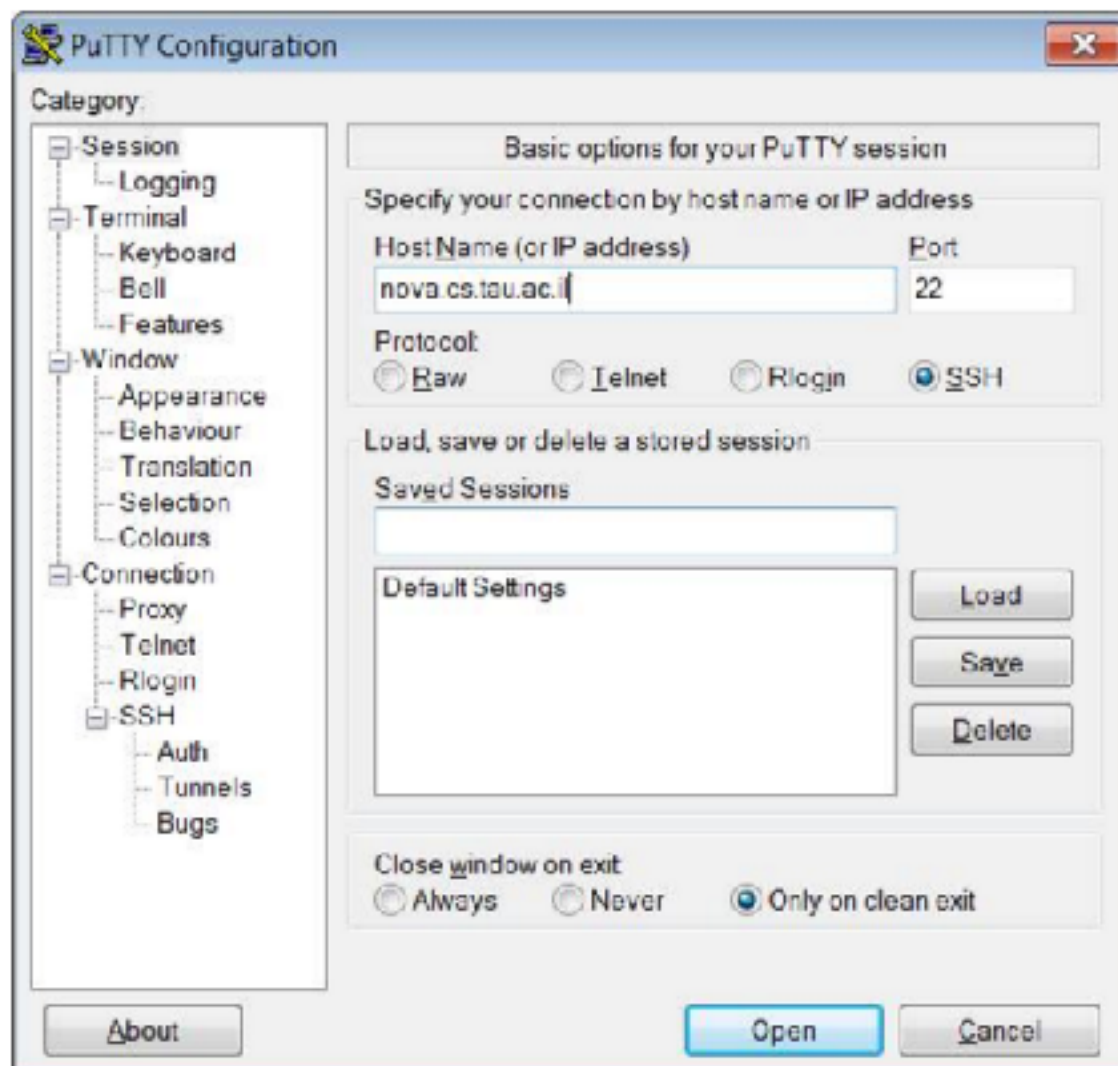
```
[mysql> select 1;
+----+
| 1  |
+----+
1 row in set (0.00 sec)
```

 Use Mysql CLI tool to connect to mysqlsrv.tau.ac.il

MYSQL: CONNECT REMOTELY (+SSH)

 **Command line connection (Windows)**

 Using Putty to Nova



MYSQL: CONNECT REMOTELY (+SSH)

SQL Software (Windows, the hard way)

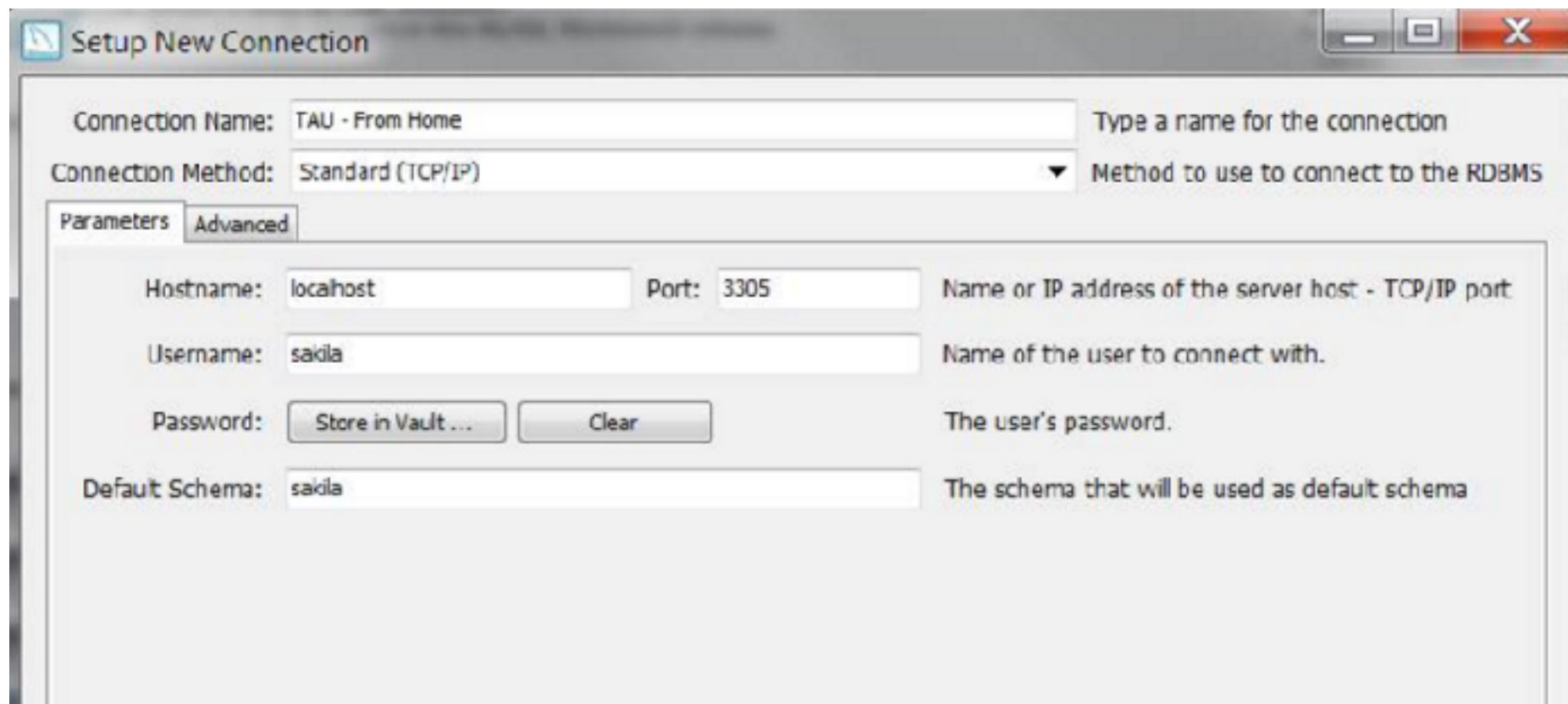
1. Download and install MySQL server for Windows from the official website, see the last slides for a step-by-step manual.
2. Read carefully the connection guide ([here](#))
3. Establish a **Tunnel** in putty as usual
4. In the Tunnel configuration, add a **Port Forwarding rule**:
 - from local port 3305
 - to mysqlsrv.cs.tau.ac.il, port 3306

MYSQL: CONNECT REMOTELY (+SSH)

SQL Software (Windows, the hard way)

4. Open Workbench, and create a new connection

5. Configure the software to connect to your local host at port 3305 (instead of mysqlsrv.cs.tau.ac.il)



The screenshot shows the 'Setup New Connection' dialog box in MySQL Workbench. The 'Connection Name' is 'TAU - From Home'. The 'Connection Method' is 'Standard (TCP/IP)'. The 'Parameters' tab is selected, showing the following fields:

- Hostname: localhost
- Port: 3305
- Username: sakila
- Password: (with 'Store in Vault ...' and 'Clear' buttons)
- Default Schema: sakila

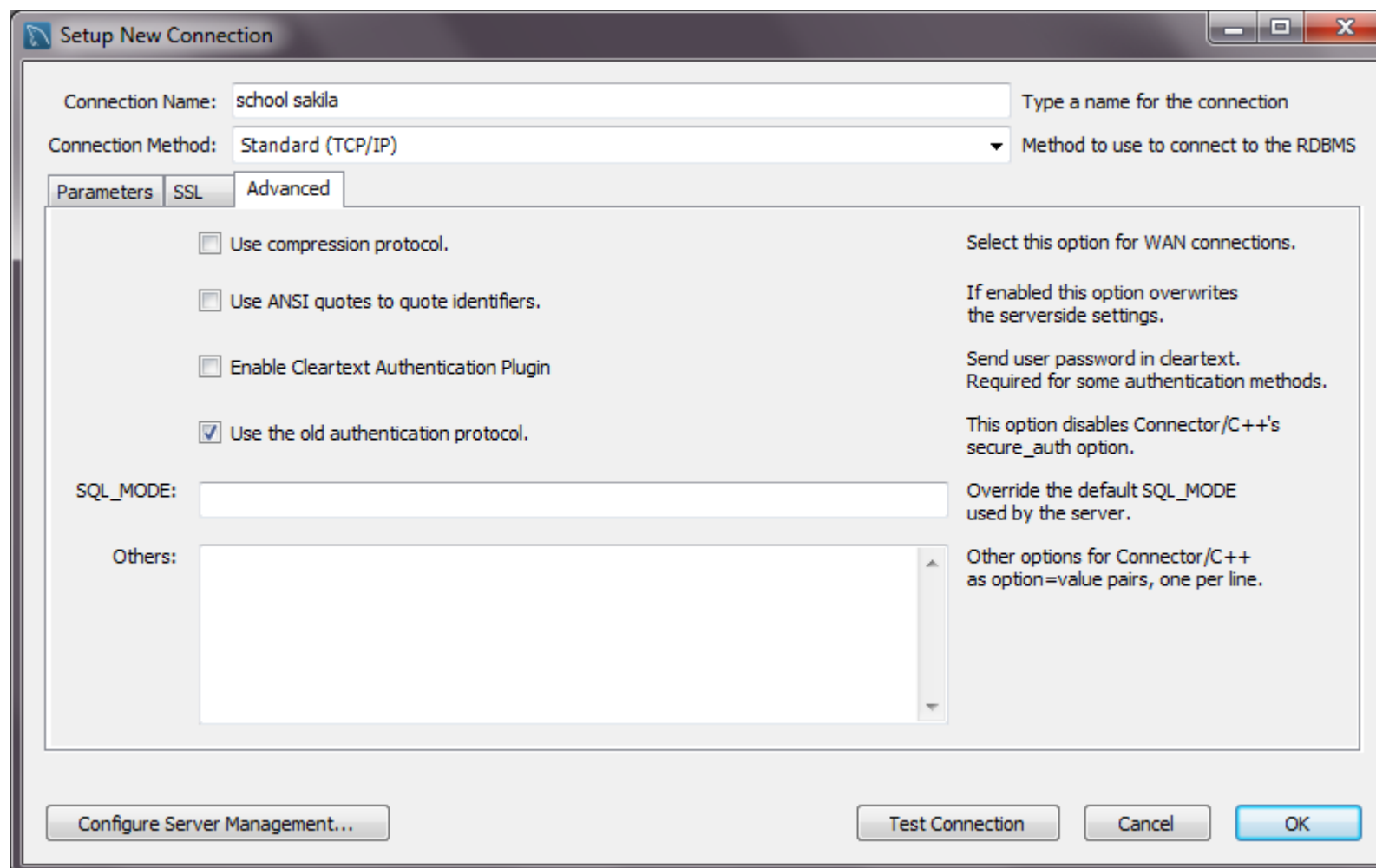
Each field has a corresponding description on the right:

- Connection Name: Type a name for the connection
- Connection Method: Method to use to connect to the RDBMS
- Hostname: Name or IP address of the server host - TCP/IP port
- Port: Name or IP address of the server host - TCP/IP port
- Username: Name of the user to connect with.
- Password: The user's password.
- Default Schema: The schema that will be used as default schema

MYSQL: CONNECT REMOTELY (+SSH)

SQL Software (Windows, the hard way)

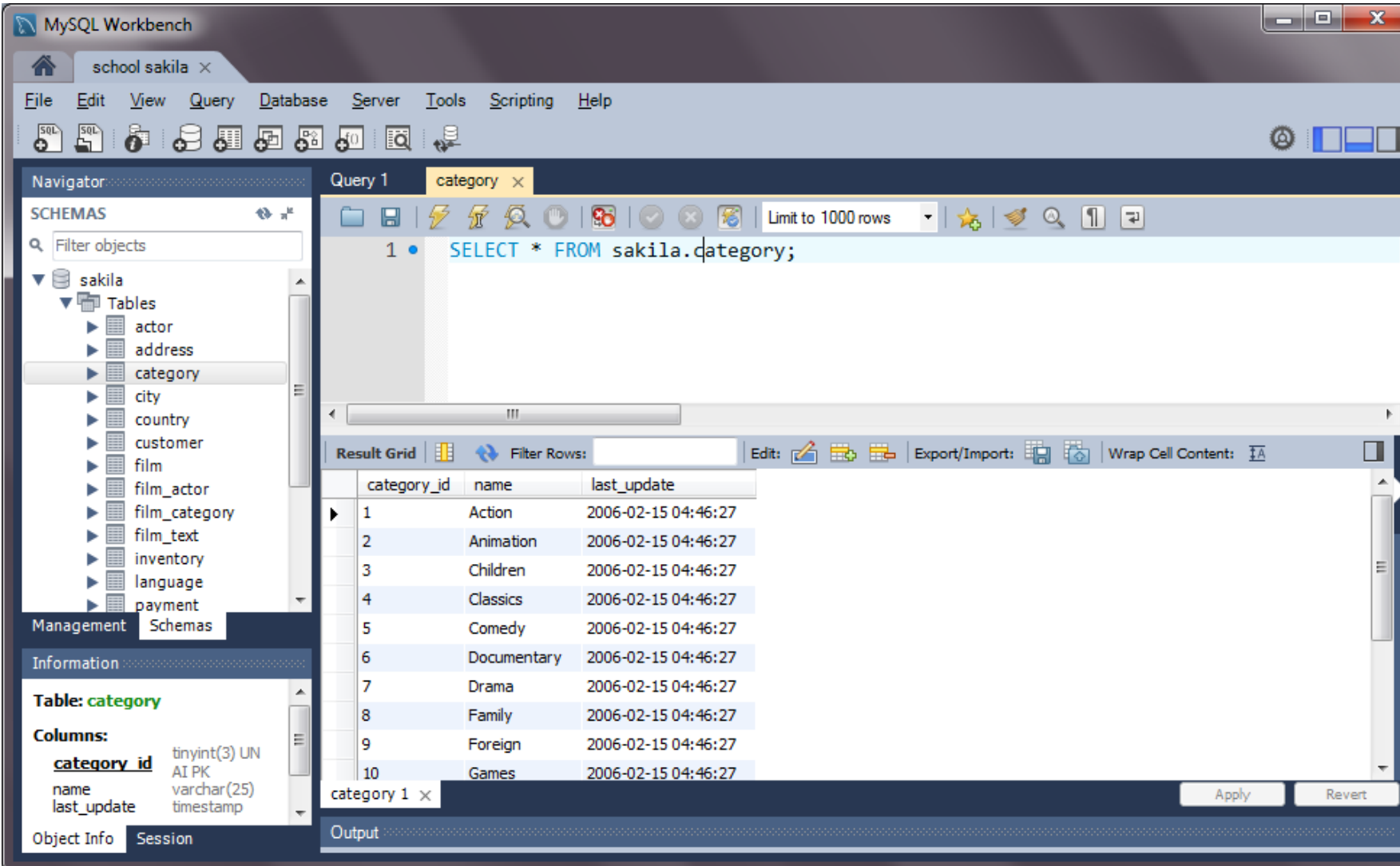
6. Support the old authentication protocol for some reason.



MYSQL: CONNECT REMOTELY (+SSH)

 **SQL Software (Windows, the hard way)**

7.Start querying for hw# 1



The screenshot shows the MySQL Workbench interface. The left sidebar displays the 'Schemas' tree with the 'sakila' database selected. The 'Tables' list under 'sakila' includes: actor, address, category, city, country, customer, film, film_actor, film_category, film_text, inventory, language, and payment. The 'category' table is highlighted. The main query editor shows the following SQL query:

```
1 • SELECT * FROM sakila.category;
```

The 'Result Grid' displays the results of the query, showing 10 rows of data. The columns are 'category_id', 'name', and 'last_update'.

category_id	name	last_update
1	Action	2006-02-15 04:46:27
2	Animation	2006-02-15 04:46:27
3	Children	2006-02-15 04:46:27
4	Classics	2006-02-15 04:46:27
5	Comedy	2006-02-15 04:46:27
6	Documentary	2006-02-15 04:46:27
7	Drama	2006-02-15 04:46:27
8	Family	2006-02-15 04:46:27
9	Foreign	2006-02-15 04:46:27
10	Games	2006-02-15 04:46:27

The bottom of the interface shows the 'Information' tab for the 'category' table, listing columns: 'category_id' (tinyint(3) UNSIGNED, PRIMARY KEY), 'name' (varchar(25)), and 'last_update' (timestamp). The 'Output' tab is also visible at the bottom.

MYSQL: CONNECT REMOTELY (+SSH)

SQL Software (All platforms)

1. Install an SQL client that support SSH Tunnel

★ Windows: Heidi SQL

★ Mac: Sequel Pro

★ ALL Platforms: DBeaver

2. Configure the SSH server in the option tab

3. Start querying

MYSQL: CONNECT REMOTELY (+SSH)

 **SQL Software (All platforms)**

Unnamed\sakila\ - HeidiSQL 9.3.0.4984

File Edit Search Tools Help

Become a donor of the HeidiSQL project Update available

Database filter Table filter

Host: mysqlsrv.cs.tau.ac... Database: sakila Query

Name ^	Rows	Size	Created	Updated	Engine	Comment
actor	200	32.0 KiB	2016-01-05 10:50:51		InnoDB	
actor_info						VIEW
address	549	96.0 KiB	2016-01-05 10:50:51		InnoDB	
category	16	16.0 KiB	2016-01-05 10:50:51		InnoDB	
city	427	64.0 KiB	2016-01-05 10:50:51		InnoDB	
country	109	16.0 KiB	2016-01-05 10:50:51		InnoDB	
customer	505	128.0 KiB	2016-01-05 10:50:51		InnoDB	
customer_list						VIEW
film	949	272.0 KiB	2016-01-05 10:50:51		InnoDB	
film_actor	5,920	272.0 KiB	2016-01-05 10:50:51		InnoDB	
film_category	829	80.0 KiB	2016-01-05 10:50:51		InnoDB	
film_list						VIEW
film_text	1,000	261.8 KiB	2016-01-05 10:50:51	2016-01-05 10:50:51	MyISAM	
inventory	5,007	368.0 KiB	2016-01-05 10:50:51		InnoDB	
language	6	16.0 KiB	2016-01-05 10:50:52		InnoDB	
nicer_but_slow...						VIEW
payment	15,422	2.1 MiB	2016-01-05 10:50:52		InnoDB	

```
20 SHOW FUNCTION STATUS WHERE `Db`='information_schema';
21 SHOW PROCEDURE STATUS WHERE `Db`='information_schema';
22 SHOW TRIGGERS FROM `information_schema`;
23 SHOW EVENTS FROM `information_schema`;
24 SELECT *, EVENT_SCHEMA AS `Db`, EVENT_NAME AS `Name` FROM information_schema.`EVENTS` WHERE `EVENT_SCHEMA`='sakila';
```

MYSQL: CONNECT REMOTELY




Web based MySQL client, very common in shared hosting web platforms.

The screenshot shows the phpMyAdmin web interface in a Mozilla Firefox browser. The address bar shows the URL: http://www.cs.tau.ac.il/phpmyadmin/index.php?target=server_status.php&token=d3713df63248f28da97a99c79b. The interface displays the 'sakila' database structure. On the left, a sidebar lists the database 'sakila (23)' and its tables. The main area shows a table structure for 'sakila' with columns: Table, Action, Records, Type, Collation, Size, and Overhead. The tables listed are: actor, actor_info, address, category, city, country, customer, customer_list, film, film_actor, film_category, film_list, film_text, inventory, language, nicer_but_slower_film_list, payment, rental, sales_by_film_category, sales_by_store, staff, staff_list, and store. The bottom of the interface shows a summary: 22 table(s), SUM, ~17,273, MYISAM, latin1_swedish_ci, 6.6 KLB, 0 B.


Table	Action	Records	Type	Collation	Size	Overhead
actor		200	InnoDB	utf8_general_ci	32.0 KLB	-
actor_info		104	VIEW	-	-	-
address		403	InnoDB	utf8_general_ci	96.0 KLB	-
category		16	InnoDB	utf8_general_ci	16.0 KLB	-
city		405	InnoDB	utf8_general_ci	44.0 KLB	-
country		103	InnoDB	utf8_general_ci	16.0 KLB	-
customer		599	InnoDB	utf8_general_ci	128.0 KLB	-
customer_list		102	VIEW	-	-	-
film		1,400	InnoDB	utf8_general_ci	172.0 KLB	-
film_actor		4,140	InnoDB	utf8_general_ci	172.0 KLB	-
film_category		1,400	InnoDB	utf8_general_ci	80.0 KLB	-
film_list		102	VIEW	-	-	-
film_text		1,400	MYISAM	utf8_general_ci	117.8 KLB	-
inventory		4,141	InnoDB	utf8_general_ci	148.0 KLB	-
language		4	InnoDB	utf8_general_ci	16.0 KLB	-
nicer_but_slower_film_list		102	VIEW	-	-	-
payment		16,149	InnoDB	utf8_general_ci	2.1 KLB	-
rental		16,144	InnoDB	utf8_general_ci	2.7 KLB	-
sales_by_film_category		102	VIEW	-	-	-
sales_by_store		102	VIEW	-	-	-
staff		2	InnoDB	utf8_general_ci	96.0 KLB	-
staff_list		102	VIEW	-	-	-
store		2	InnoDB	utf8_general_ci	16.0 KLB	-
22 table(s)		SUM				
		~17,273	MYISAM	latin1_swedish_ci	6.6 KLB	0 B


MYSQL: META-DATA

Information_schema

 MySQL server has a default database called “information_schema”

 TABLES table contains information about each table in the database. e.g, name, type, number of rows etc.

 COLUMNS table contains information about each column, such as the table it's belong to, the data type, etc.

 USER_PRIVILEGES table contains information about the users listed in the database (do not confuse with web-users accessing the website).

MYSQL: META-DATA

MySQL Data types

 Each column has a predefined type and possibly a default value

★Integers:TINYINT, MEDIUMINT, BIGINT


★Strings:VARCHAR (strings), BLOB (for binaries)

★Dates:TIMESTAMP, DATE, DATETIME


 Set when the database schema is created

MYSQL: META-DATA

MySQL users privileges

 Root user: granting permissions, creating users, altering creating and deleting data

 Application users: usually read only, no grant.

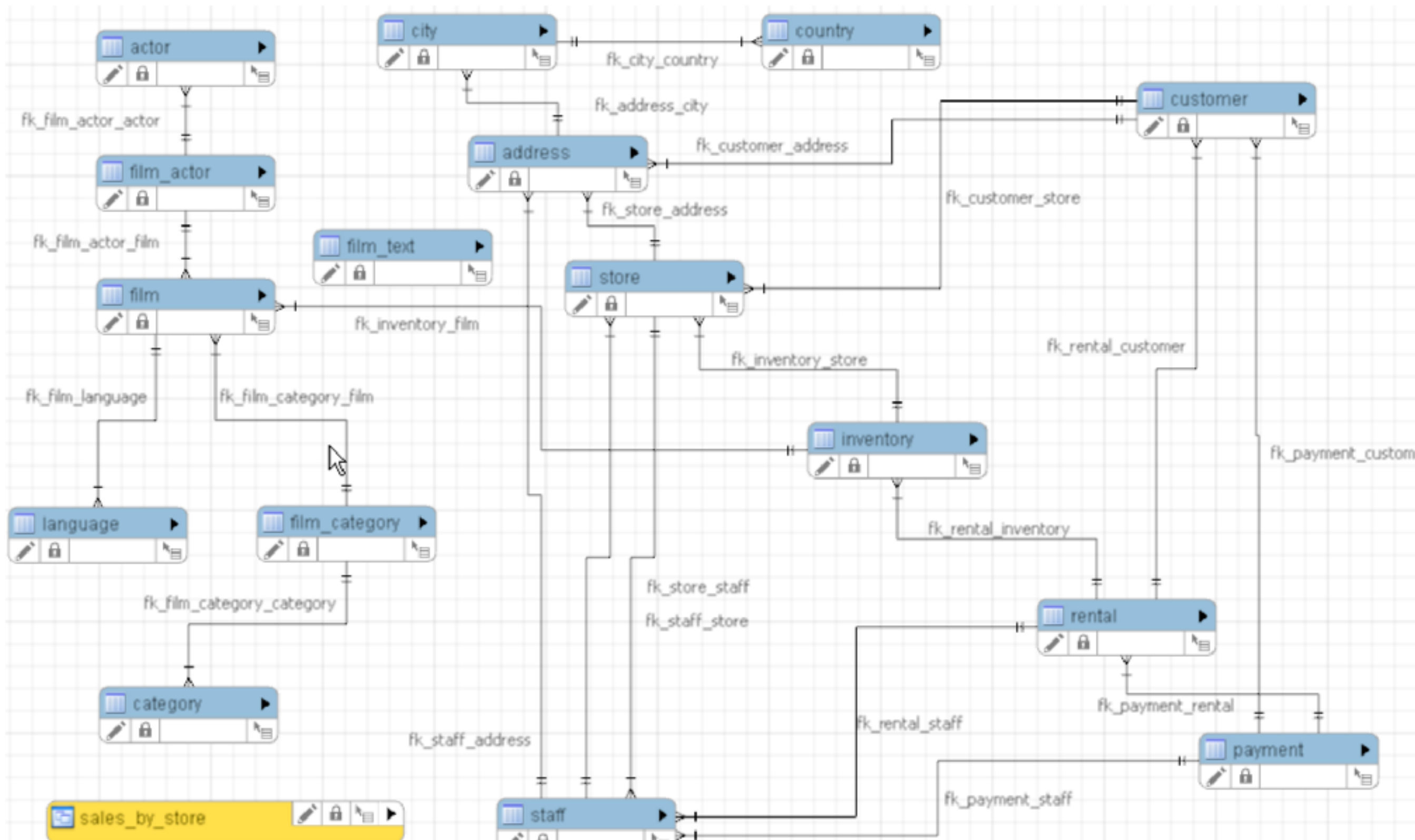
 Don't every use root user in a DB connection string (we will discuss it over the next recitations)

HW#1: SQL QUERIES

 You will be writing SQL queries and execute them over the Sakila Database.

- Address: mysqlsrv.cs.tau.ac.il. User: sakila, password: sakila, DB name: sakila
- First establish ssh connection, or just com to UNI to work.
- Note that the schema and data tuples on our server might be different than other resources you will find.
- The DB server is not always stable. Contact system for support and just *start early*

MYSQL: SAKILA SCHEMA



MYSQL: SAKILA SCHEMA

 Example Query:

```
mysql> SELECT CONCAT(customer.last_name, ' ', customer.first_name) AS customer,  
-> address.phone, film.title  
-> FROM rental INNER JOIN customer ON rental.customer_id = customer.customer_id  
-> INNER JOIN address ON customer.address_id = address.address_id  
-> INNER JOIN inventory ON rental.inventory_id = inventory.inventory_id  
-> INNER JOIN film ON inventory.film_id = film.film_id  
-> WHERE rental.return_date IS NULL  
-> AND rental_date + INTERVAL film.rental_duration DAY < CURRENT_DATE()  
-> LIMIT 5;
```


MYSQL: SAKILA SCHEMA

Example Query:

```
mysql> SELECT CONCAT(customer.last_name, ' ', customer.first_name) AS customer,  
-> address.phone, film.title  
-> FROM rental INNER JOIN customer ON rental.customer_id = customer.customer_id  
-> INNER JOIN address ON customer.address_id = address.address_id  
-> INNER JOIN inventory ON rental.inventory_id = inventory.inventory_id  
-> INNER JOIN film ON inventory.film_id = film.film_id  
-> WHERE rental.return_date IS NULL  
-> AND rental_date + INTERVAL film.rental_duration DAY < CURRENT_DATE()  
-> LIMIT 5;
```

Results:

customer	phone	title
OLVERA, DWAYNE	62127829280	ACADEMY DINOSAUR
HUEY, BRANDON	99883471275	ACE GOLDFINGER
BROWN, ELIZABETH	10655648674	AFFAIR PREJUDICE
OWENS, CARMEN	272234298332	AFFAIR PREJUDICE
HANNON, SETH	864392582257	AFRICAN EGG

MYSQL: SAKILA SCHEMA

Example Query:

```
mysql> SELECT CONCAT(customer.last_name, ' ', customer.first_name) AS customer,  
-> address.phone, film.title  
-> FROM rental INNER JOIN customer ON rental.customer_id = customer.customer_id  
-> INNER JOIN address ON customer.address_id = address.address_id  
-> INNER JOIN inventory ON rental.inventory_id = inventory.inventory_id  
-> INNER JOIN film ON inventory.film_id = film.film_id  
-> WHERE rental.return_date IS NULL  
-> AND rental_date + INTERVAL film.rental_duration DAY < CURRENT_DATE()  
-> LIMIT 5;
```


Results:

customer	phone	title
OLVERA, DWAYNE	62127829280	ACADEMY DINOSAUR
HUEY, BRANDON	99883471275	ACE GOLDFINGER
BROWN, ELIZABETH	10655648674	AFFAIR PREJUDICE
OWENS, CARMEN	272234298332	AFFAIR PREJUDICE
HANNON, SETH	864392582257	AFRICAN EGG

YOUR BEST FRIENDS

 MySQL is the most common database used on the web.

 Therefore, **stackoverflow** is your friend.

 Another good friend you got : w3schools.com. for everything you need regarding web development and basic SQL use.

 MySQL cheatsheet:

 <https://en.wikibooks.org/wiki/MySQL/CheatSheet>

Install MySQL at Home

✖ MySQL Community Server

<http://www.mysql.com/downloads/mysql/>

MySQL Community Server 5.6.22

Select Platform:

Microsoft Windows ▼

Recommended Download:

MySQL Installer 5.6 for Windows

**All MySQL Products. For All Windows Platforms.
In One Package.**

Starting with MySQL 5.6 the MySQL Installer package replaces the server-only MSI packages.



Windows (x86, 64-bit), MySQL Installer MSI

Download

Registration is Optional

Begin Your Download - mysql-installer-community-5.6.22.0.msi

Login Now or Sign Up for a free account.

An Oracle Web Account provides you with the following advantages:

- Fast access to MySQL software downloads
- Download technical White Papers and Presentations
- Post messages in the MySQL Discussion Forums
- Report and track bugs in the MySQL bug system
- Comment in the MySQL Documentation

Login »

using my Oracle Web account

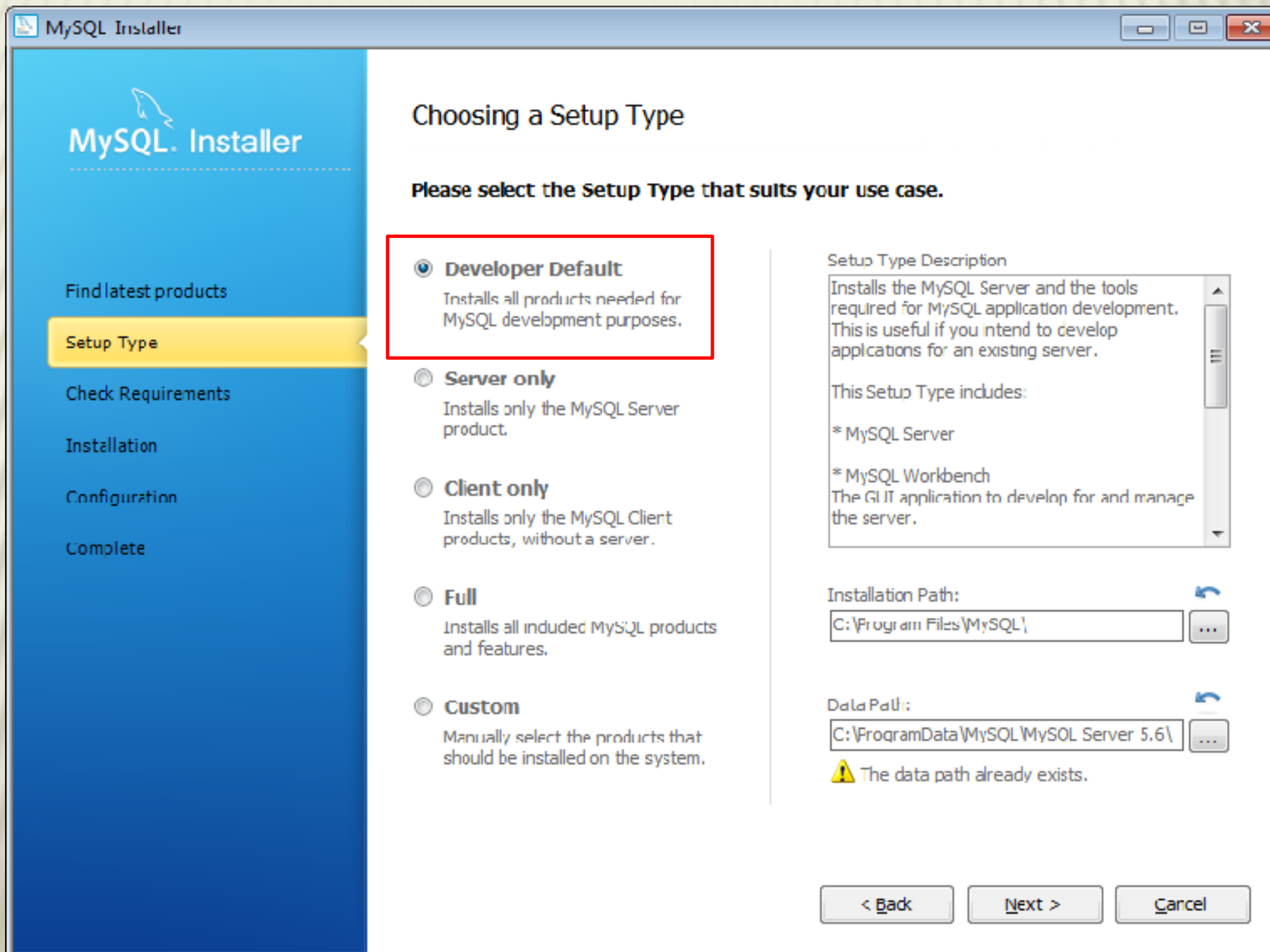
Sign Up »

for an Oracle Web account

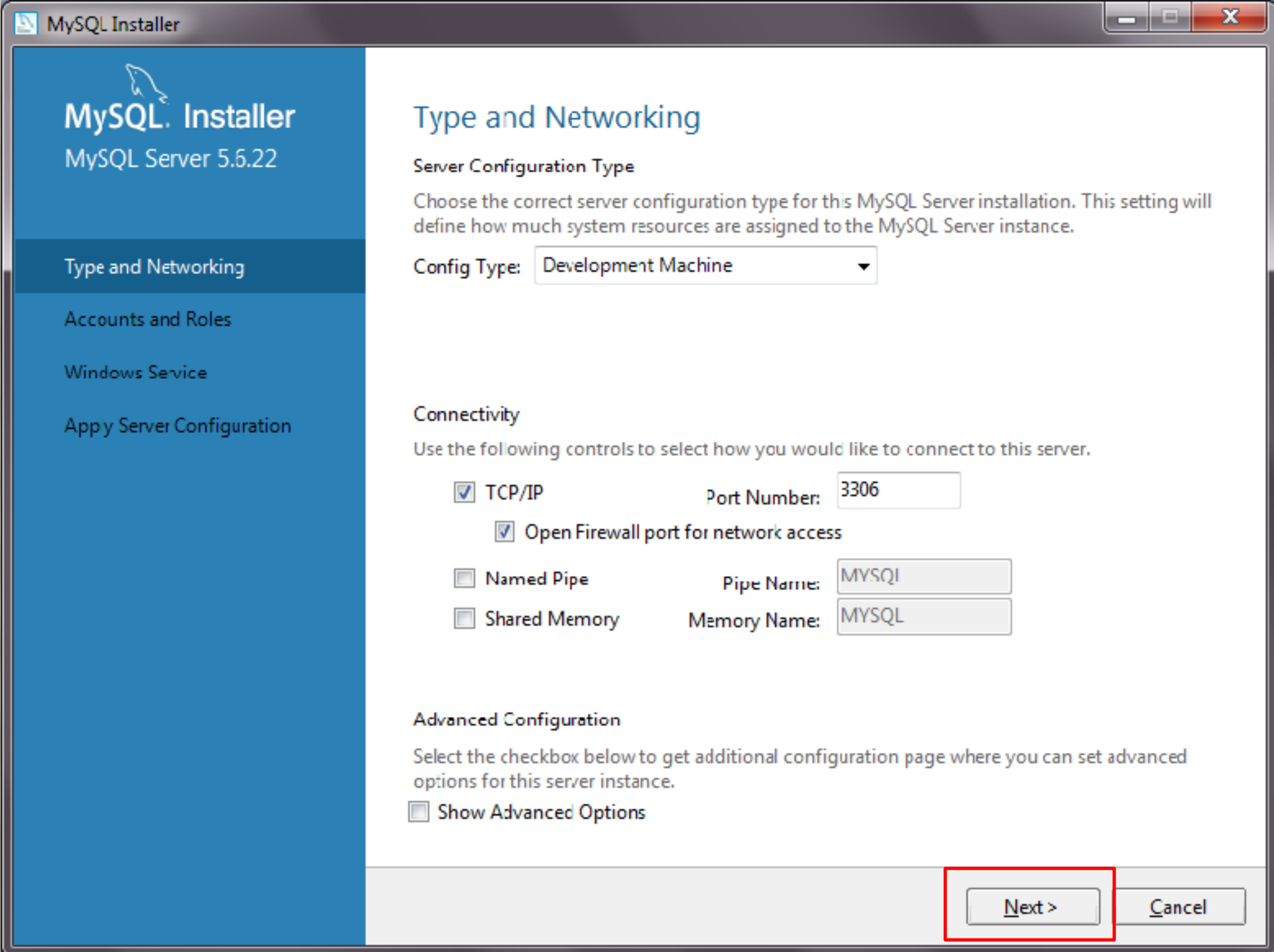
MySQL.com is using Oracle SSO for authentication. If you already have an Oracle Web account, click the Login link. Otherwise, link and following the instructions.

No thanks, just start my download.

Installation using an Installer



Configuration

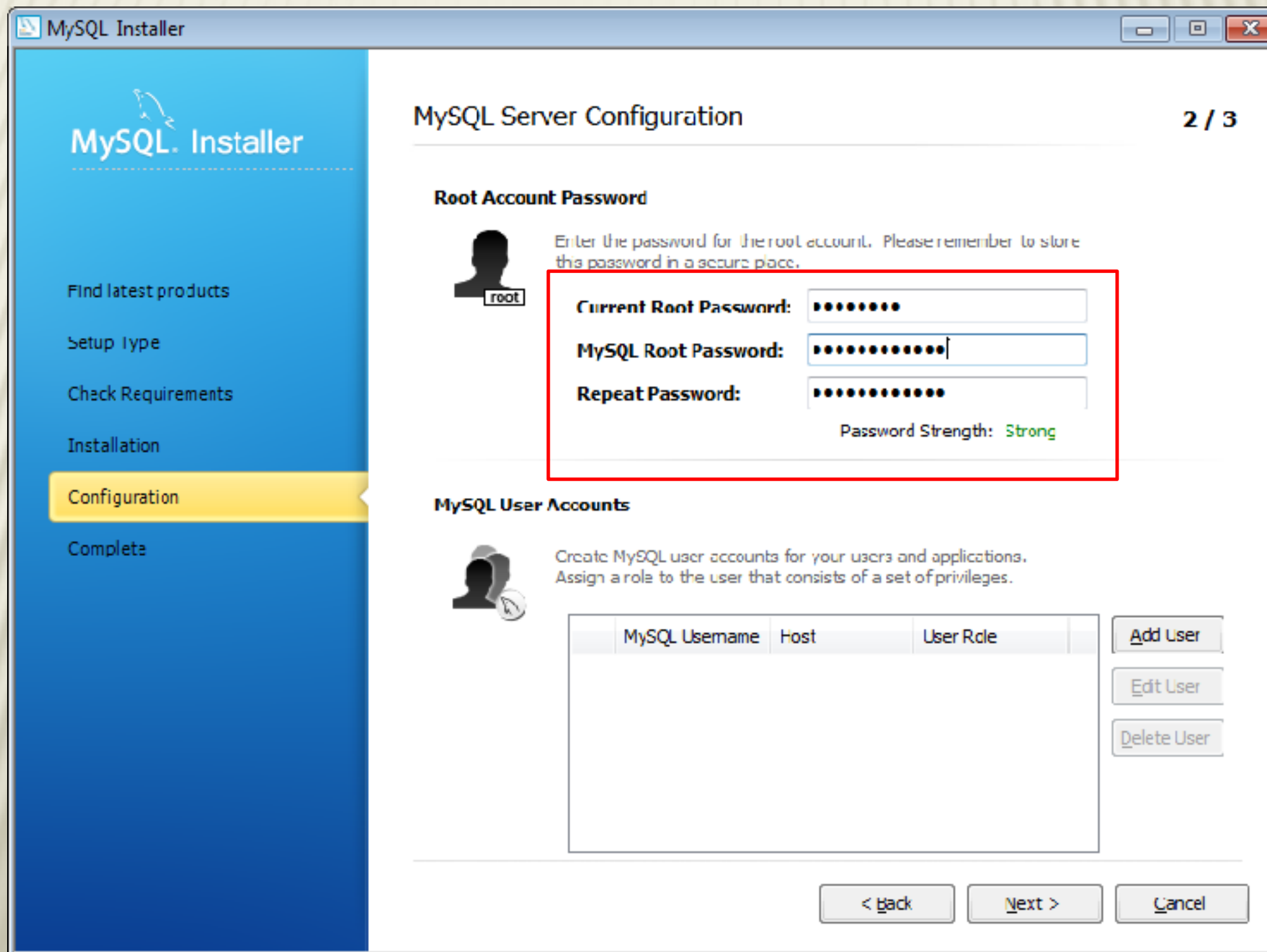


The image shows a screenshot of the MySQL Installer window. The window has a title bar that says 'MySQL Installer'. On the left side, there is a blue sidebar with the MySQL logo and the text 'MySQL Installer' and 'MySQL Server 5.6.22'. Below this, there are four menu items: 'Type and Networking' (which is highlighted), 'Accounts and Roles', 'Windows Service', and 'Apply Server Configuration'. The main area of the window is titled 'Type and Networking'. It contains the following sections:

- Server Configuration Type**: A text box with the label 'Config Type:' and a dropdown menu showing 'Development Machine'.
- Connectivity**: A text box with the label 'Use the following controls to select how you would like to connect to this server.' Below this are three options:
 - ☒ TCP/IP: Port Number: 3306
 - ☒ Open Firewall port for network access
 - ☐ Named Pipe: Pipe Name: MYSQL
 - ☐ Shared Memory: Memory Name: MYSQL
- Advanced Configuration**: A text box with the label 'Select the checkbox below to get additional configuration page where you can set advanced options for this server instance.' Below this is a checkbox labeled 'Show Advanced Options'.

At the bottom right of the window, there are two buttons: 'Next >' and 'Cancel'. The 'Next >' button is highlighted with a red rectangle.

Installation using an Installer



The image shows the MySQL Installer window at the 'MySQL Server Configuration' step (2/3). The left sidebar contains navigation links: 'Find latest products', 'Setup type', 'Check Requirements', 'Installation', 'Configuration' (highlighted), and 'Complete'. The main area is divided into two sections. The 'Root Account Password' section, highlighted with a red box, contains three password fields: 'Current Root Password' (filled with dots), 'MySQL Root Password' (with a cursor), and 'Repeat Password' (filled with dots). Below these fields, the 'Password Strength' is indicated as 'Strong' in green text. The 'MySQL User Accounts' section below it includes a description, a table with columns 'MySQL Username', 'Host', and 'User Role', and buttons for 'Add User', 'Edit User', and 'Delete User'. At the bottom, there are navigation buttons: '< Back', 'Next >', and 'Cancel'.

MySQL Installer

MySQL Server Configuration 2 / 3

Root Account Password

Enter the password for the root account. Please remember to store this password in a secure place.

Current Root Password: [password masked]

MySQL Root Password: [password masked]

Repeat Password: [password masked]

Password Strength: Strong

MySQL User Accounts

Create MySQL user accounts for your users and applications. Assign a role to the user that consists of a set of privileges.

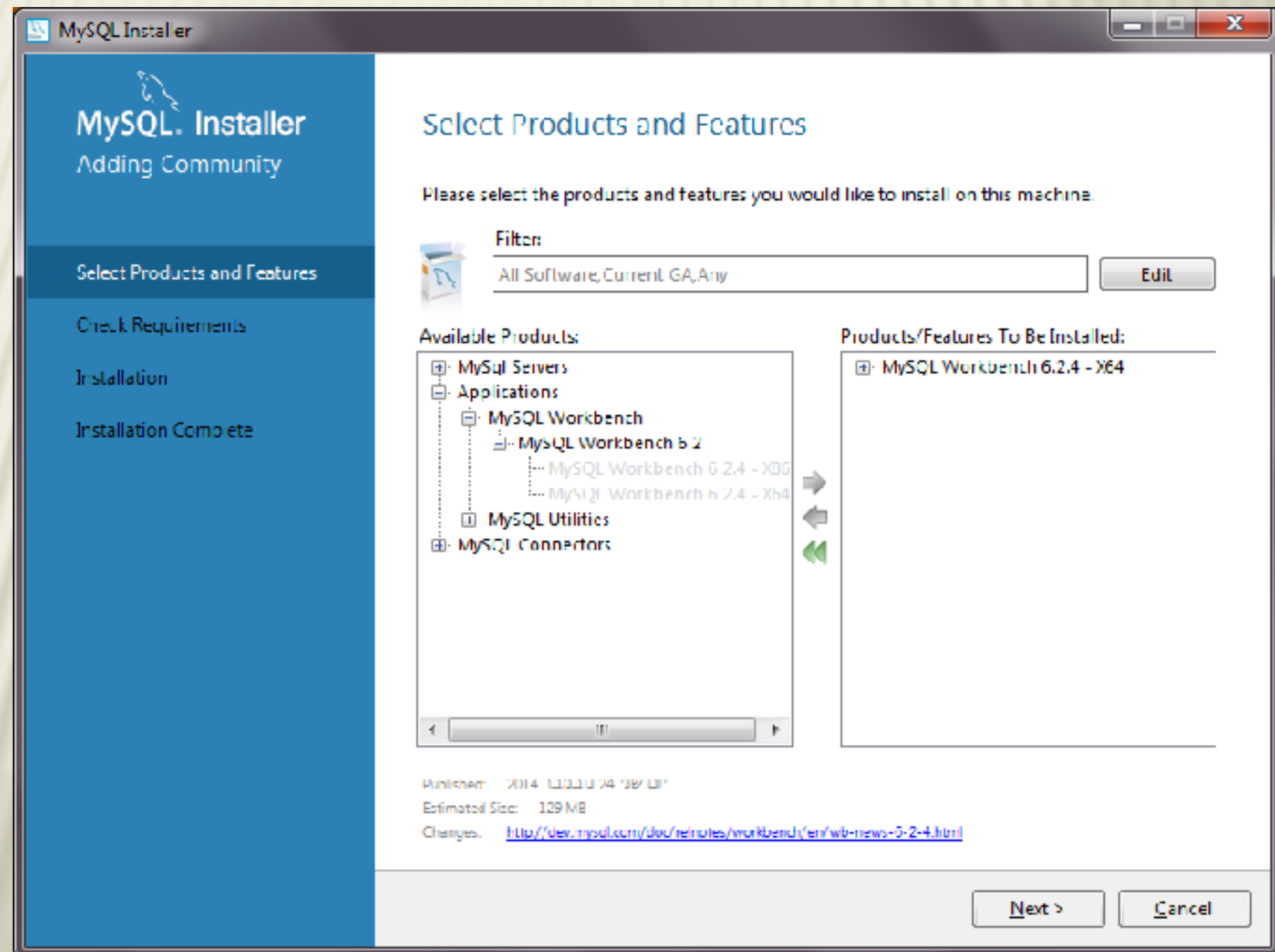
MySQL Username	Host	User Role
----------------	------	-----------

Add User Edit User Delete User

< Back Next > Cancel

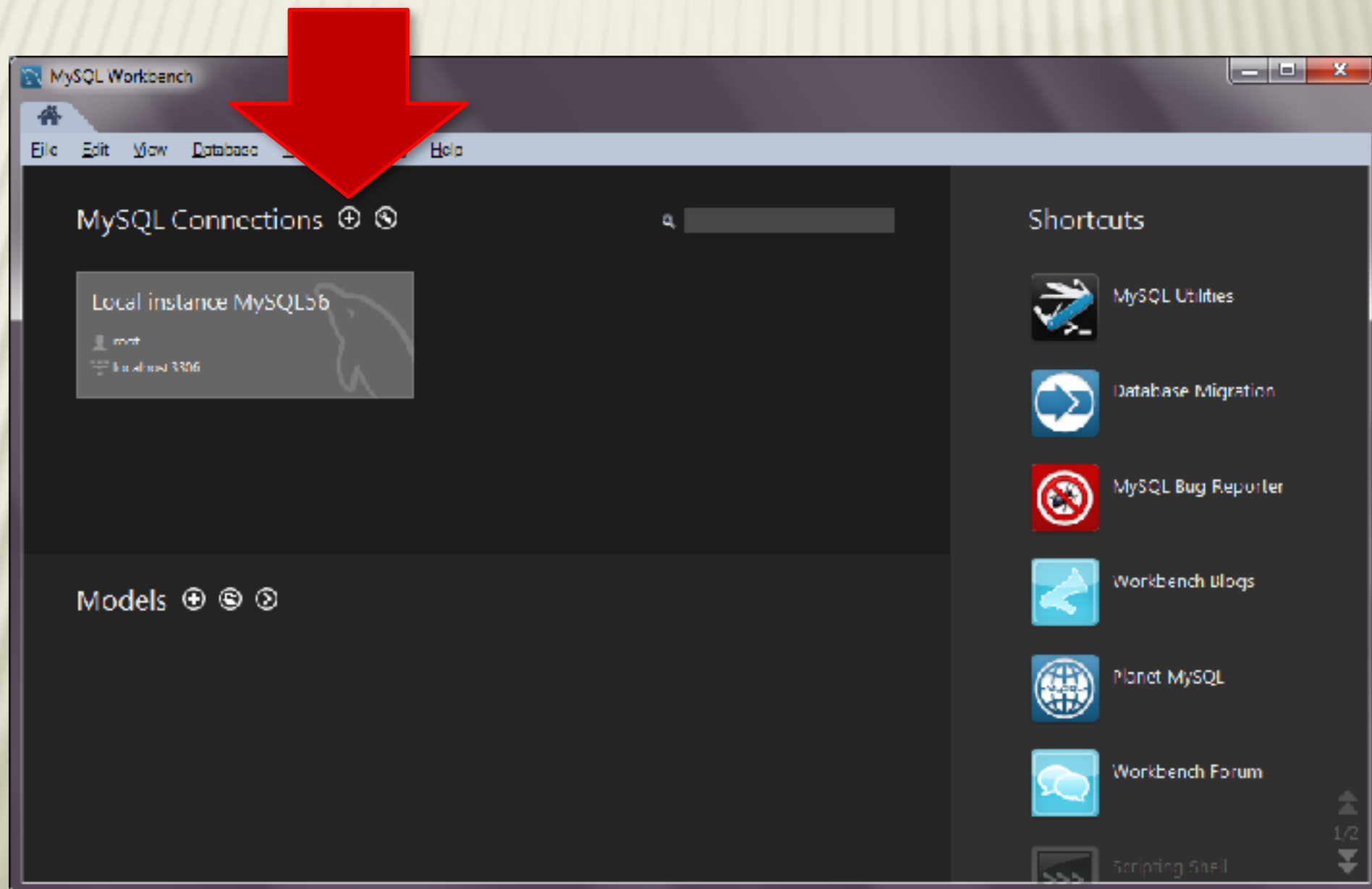
MySQL Workbench

- ✖ Make sure to install server, workbench and examples



Example: connecting to school server

- ✖ Open the tunnel!
- ✖ Then open workbench and create new connection



Configure the connection

Setup New Connection

Connection Name: Type a name for the connection

Connection Method: Method to use to connect to the RDBMS

Parameters SSL Advanced

Hostname: Port: Name or IP address of the server host. - and TCP/IP port.

Username: Name of the user to connect with.

Password: The user's password. Will be requested later if it's not set.

Default Schema: The schema to use as default schema. Leave blank to select it later.

Support old authentication protocol

Setup New Connection

Connection Name: Type a name for the connection

Connection Method: Method to use to connect to the RDBMS

Parameters SSL **Advanced**

☐ Use compression protocol. Select this option for WAN connections.

☐ Use ANSI quotes to quote identifiers. If enabled this option overwrites the serverside settings.

☐ Enable Cleartext Authentication Plugin Send user password in cleartext. Required for some authentication methods.

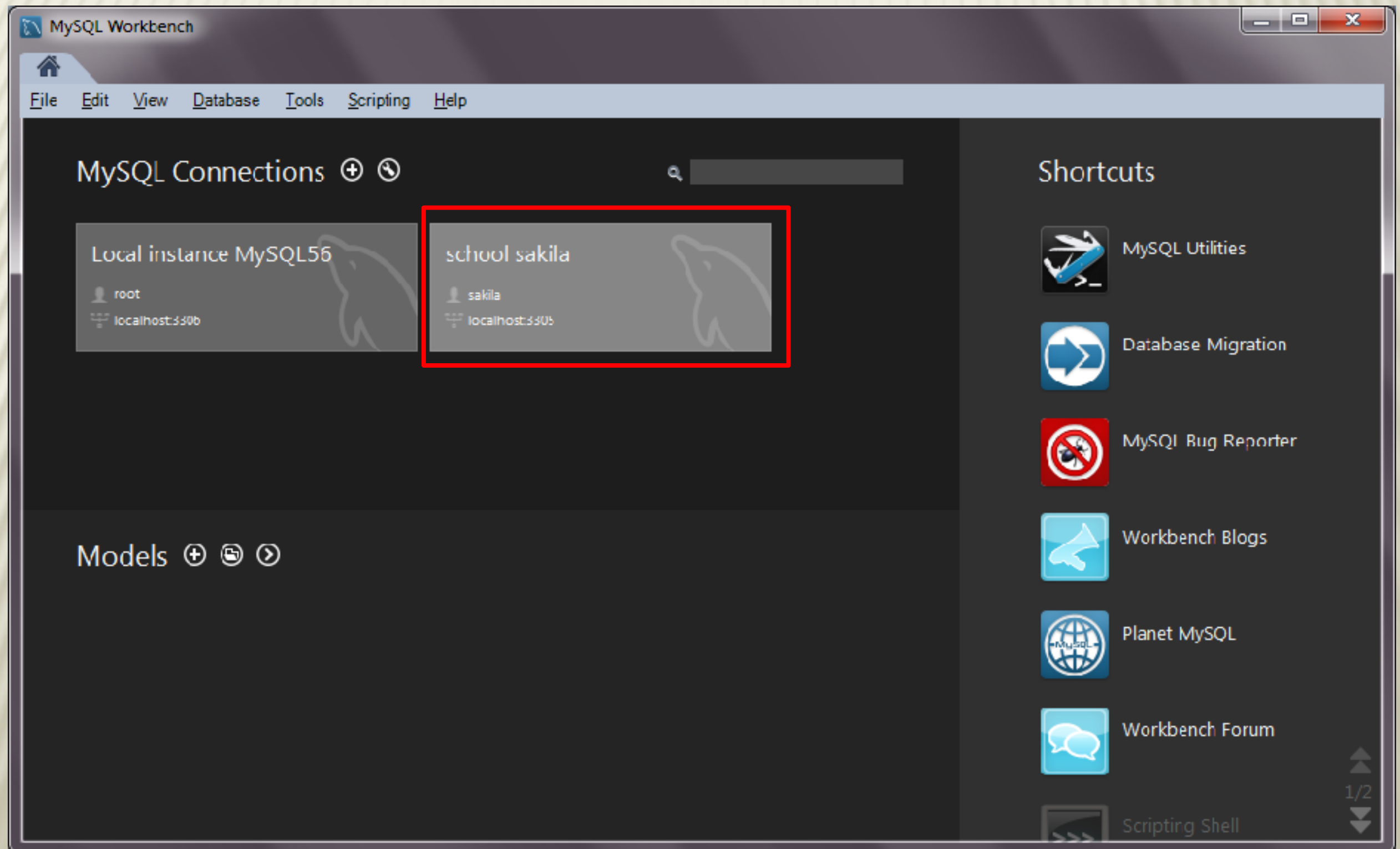
☒ Use the old authentication protocol. This option disables Connector/C++'s secure_auth option.

SQL_MODE: Override the default SQL_MODE used by the server.

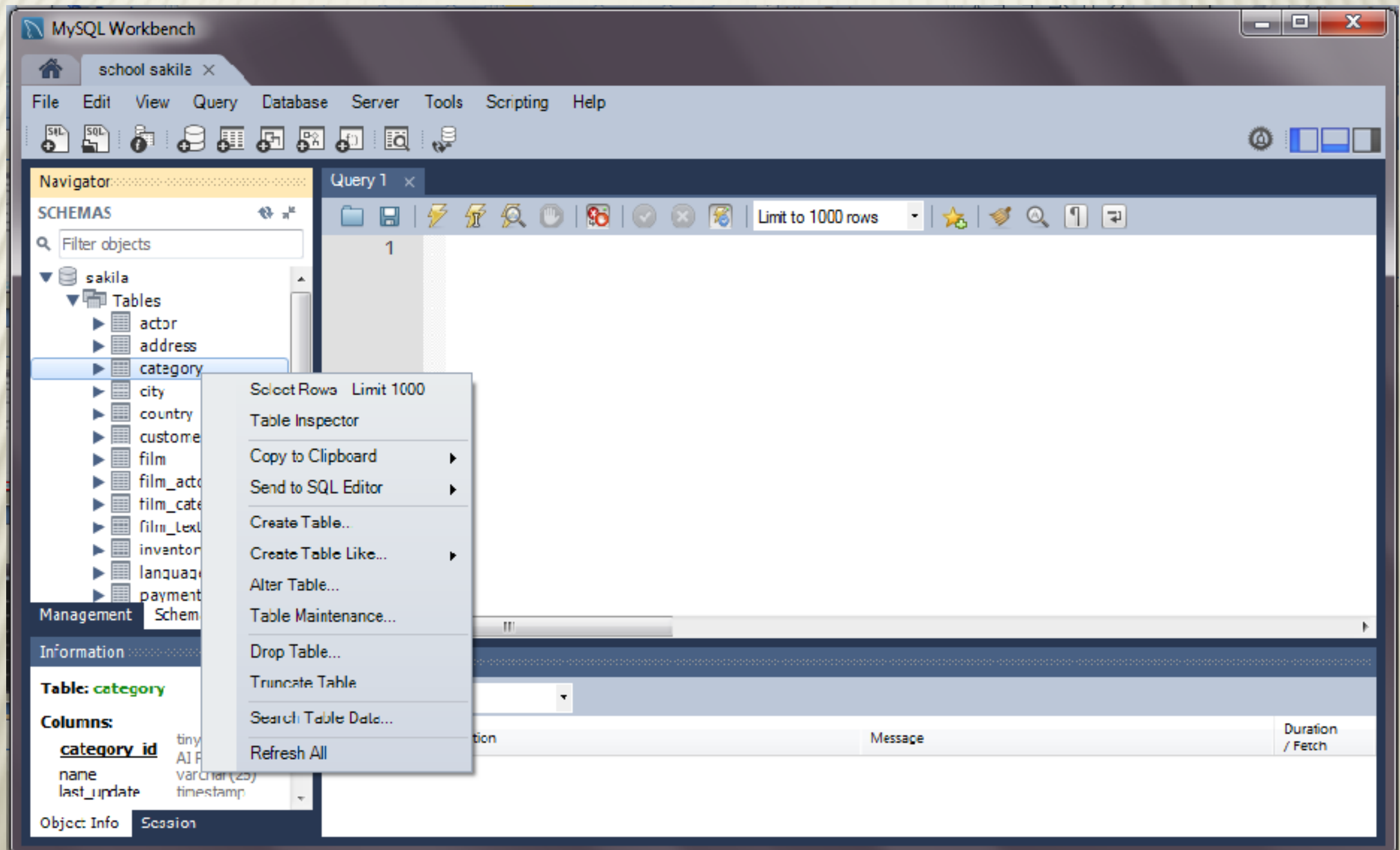
Others: Other options for Connector/C++ as option=value pairs, one per line.

Configure Server Management... Test Connection Cancel OK

Open the new connection



Now you can query the SQL data



... and the result

The screenshot shows the MySQL Workbench interface with the 'sakila' database selected. The 'category' table is highlighted in the Navigator pane. The Query Editor shows the following SQL query:

```
SELECT * FROM sakila.category;
```

The Result Grid displays the following data:

category_id	name	last_update
1	Action	2006-02-15 04:46:27
2	Animation	2006-02-15 04:46:27
3	Children	2006-02-15 04:46:27
4	Classics	2006-02-15 04:46:27
5	Comedy	2006-02-15 04:46:27
6	Documentary	2006-02-15 04:46:27
7	Drama	2006-02-15 04:46:27
8	Family	2006-02-15 04:46:27
9	Foreign	2006-02-15 04:46:27
10	Games	2006-02-15 04:46:27

The Information pane shows the table structure for 'category':

Column	Type
category_id	tinyint(3) UNSIGNED AUTOINCREMENT PRIMARY KEY
name	varchar(25)
last_update	timestamp